

Claims:

1. An aqueous composition useful for polishing copper on a semiconductor wafer comprising by weight percent 1 to 15 oxidizer, 0.1 to 1 inhibitor for a nonferrous metal, 0.05 to 3 complexing agent for the nonferrous metal, 0.01 to 5 carboxylic acid polymer, 0.01 to 5 modified cellulose, 0.0001 to 2 salt having a cationic and an anionic component, and balance water, the salt reducing noise level from vibration between the wafer and a polishing pad.

2. The composition of claim 1 wherein the cationic component comprises an ionized element selected from the group comprising Groups IA, IIA, IIIA, IVA and IVB of the periodic table of the elements, zinc, cerium, iron, ammonium and guanidine ions.

3. The composition of claim 1 wherein the anionic component is selected from the group comprising chloride, bromide, iodide, nitrate, phosphate, polyphosphate, sulfate, carbonate and perchlorate ions.

4. The composition of claim 1 wherein the salt is selected from the group comprising comprising aluminum chloride, zirconyl nitrate, zirconyl sulfate, cerium nitrate, aluminum nitrate, aluminum bromide, aluminum iodide, aluminum chloride, zirconyl chloride, tin chloride, aluminum perchlorate, magnesium chloride, zinc chloride, magnesium perchlorate, iron chloride, potassium chloride, potassium sulfate, guanidine hydrochloride, guanidine nitrate, guanidine sulfate, guanidine carbonate, ammonium chloride, ammonium nitrate and ammonium phosphate.

5. The composition of claim 1 wherein the carboxylic acid polymer comprises a blend of poly(meth)acrylic acid, the blend comprising a first polymer having a number average molecular weight of 20,000 to 100,000 and at least a second polymer having a number average molecular weight of 200,000 to 1,500,000.

6. The composition of claim 5 wherein the first polymer is a polyacrylic acid having a number average molecular weight of 30,000 and the second polymer is a

polyacrylic acid having a number average molecular weight of 250,000, the first and second polymers present in a 1:1 weight ratio.

7. The composition of claim 1 wherein the modified cellulose is carboxymethyl cellulose.

8. The composition of claim 1 wherein the solution has a pH under 5.

9. A method for polishing copper from a semiconductor wafer comprising:
contacting the wafer with a polishing composition, the wafer containing the copper, the polishing composition comprising by weight percent 1 to 15 oxidizer, 0.1 to 1 inhibitor for a nonferrous metal, 0.05 to 3 complexing agent for the nonferrous metal, 0.01 to 5 carboxylic acid polymer, 0.01 to 5 modified cellulose, 0.0001 to 2 salt, and balance water; and

polishing the wafer with a polishing pad, the salt reducing noise level from vibration between the wafer and the polishing pad.

10. The method of claim 9 wherein the salt reduces residual polishing time of the copper.